REMARKS/ARGUMENTS

After the foregoing amendment, Claims 1-24 are currently pending in this application.

Allowable Subject Matter

The Examiner is thanked for indicating that claims 7-11 contain allowable subject matter.

Double Patenting Rejection

Claims 1-24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of copending U.S. Application No. 10/771,613 (hereinafter "'613") and claims 1-22 of copending U.S. Patent Application No. 10/772,017 (hereinafter "'017").

Applicants traverse the double patenting rejection. The claims in question are patentably distinct from each other. In the present application, the claims are directed to a method and system for synchronizing a secondary volume with a primary volume and a method and system for restoring a primary volume from a secondary volume. In the '613 application, the claims are directed to a method and system for providing continuous data protection. In the '017 application, the claims

are directed to a method and system for data recovery in a continuous data protection system.

Both the '613 and '017 applications are being handled by the same Examiner, and that Examiner has not raised any double patenting issues between the '613 and '017 applications. While all three of these applications generally relate to continuous data protection, all three applications distinctly describe and claim different aspects and/or components of a continuous data protection system. Because the claims are distinct (i.e., each set of claims would be patentable over the others, per MPEP §802.01(II)), the provisional rejection on the ground of nonstatutory obviousness-type double patenting is improper.

Applicants respectfully request that the provisional double patenting rejection be withdrawn.

Objections to the Specification

The Examiner objected to the title of the invention because it is not descriptive. The title has been amended to read "METHOD AND SYSTEM FOR SYNCHRONIZING VOLUMES IN A CONTINUOUS DATA PROTECTION SYSTEM". The amended title corresponds to the preamble of claim 1.

The withdrawal of the objection to the title is respectfully requested.

Claim Rejections - 35 USC §112

Claims 13-24 stand rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. In particular, the Examiner argues that the "means language presented in the claims is not accompanied by corresponding structure in the specification and appear to be software per se."

Applicants respectfully traverse this rejection. Per MPEP §2181(II), "disclosure of structure corresponding to a means-plus-function limitation <u>may be implicit</u> in the written description if it would have been clear to those skilled in the art what structure must perform the function recited in the means-plus-function limitation." (Page 2100-232, emphasis added.)

Based on the description of the present invention, one skilled in the art could readily derive the structures to implement the invention as recited in claims 13-24.

Based on the arguments presented above, withdrawal of the 35 U.S.C. §112 rejection of claims 13-24 is respectfully requested.

Claim Rejections - 35 USC §101

Claims 13-24 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. In particular, the Examiner

argues that "the claimed means appear to correspond only to software per se without any accompanying structure."

Applicants respectfully traverse this rejection. Independent claims 13 and 24 include physical components which describe a system that can copy data from a primary volume to a secondary volume (claim 13) and a system that can load a snapshot from a secondary volume to a primary volume (claim 24). Such physical acts are statutory subject matter as they produce a useful, tangible, and concrete result (MPEP §2106). Furthermore, per MPEP §2106.01(I) (emphasis added):

> Computer programs are often recited as part of a claim. USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, <u>the claim remains statutory</u> irrespective of the fact that a computer program is included in the claim.

Based on the arguments presented above, withdrawal of the 35 U.S.C. §101 rejection of claims 13-24 is respectfully requested.

Claim Rejections - 35 USC §102

Claims 1, 2, 13, and 14 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,578,120 to Crockett et al. (hereinafter "Crockett").

Crockett relates to a system and method for synchronizing data between a primary volume and a secondary volume. A consecutive group of tracks is read from the primary storage subsystem (SCU) and sent to the secondary SCU (column 8,

lines 13-18). For each group of tracks, the primary SCU is monitored to determine if any changes are made to the group of tracks. If changes are made to the tracks on the primary SCU, those changes are recorded, and the tracks are then written to the secondary SCU (column 8, lines 23-30). Crockett works with "record sets", which are defined to be "a logical or copy set of only updates to consecutive records located the same DASD track." (Column 8, lines 33-35.) The secondary SCU keeps track of the address of the last primary track written to the secondary SCU, which is used to avoid the situation of an updated track being overwritten by a primary track (column 8, line 65 to column 9, line 10).

Applicants traverse this rejection for the following reasons. First, the Examiner argues that Crockett teaches the step of "comparing the scanned region with a corresponding region of the secondary volume" and cites column 8, line 57 to column 9, line 2 of Crockett. This section of Crockett describes that the secondary SCU keeps "a copy of the address of the last one of the primary tracks written out to the secondary volume" and uses this information to determine whether an updated track would be overwritten by an original track (column 8, line 67 to column 9, line 6). Crockett compares the address of the last written location to make this determination, and does not compare a region of the primary volume to the corresponding region of the secondary volume.

Second, the Examiner argues that Crockett teaches the step of "storing an identification of the scanned region in a compare delta map when the comparing step results in a discrepancy between the scanned region and the corresponding region" and cites column 8, lines 28-30 and 61-63 of Crockett. Crockett "establishes" a group of tracks, which means that after a group of tracks is read, the primary SCU monitors the group of track to determine if any changes are made (column 8, lines 23-26). If there are any changes, a record set is formed to hold the changes and the record set is sent to the secondary SCU (column 8, lines 26-30). Crockett does not store an identification of a region if any changes have been made; the actual changes themselves are stored. In addition, Crockett does not use a compare delta map.

Third, the Examiner argues that Crockett teaches the step of "copying data from the primary volume to the secondary volume, using the compare delta map as a guide to locate the data to copy" and cites column 8, lines 39-41 of Crockett. As noted above, Crockett does not use a compare delta map nor an equivalent structure, and therefore cannot perform this step.

Because Crockett does not disclose several of the elements of claims 1 and 13 (comparing a scanned region of the primary volume with a corresponding region of the secondary volume; storing an identification of the scanned region in a compare delta map when the comparison results in a discrepancy between the scanned

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region and the corresponding region; and copying data from the primary volume to the secondary volume, using the compare delta map as a guide to locate the data to copy), the present invention is distinguishable over Crockett. Claims 2 and 14 are dependent upon claims 1 and 13, respectively, which the Applicants believe are allowable over the cited prior art of record for the same reasons provided above.

Based on the arguments presented above, withdrawal of the 35 U.S.C. §102(e) rejection of claims 1, 2, 13, and 14 is respectfully requested.

Claims 12 and 24 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2005/0144407 to Colgrove et al. (hereinafter "Colgrove").

Colgrove discloses a system and method for synchronizing a primary snapshot and a secondary snapshot. As shown in Figure 3F and described in paragraph 0061, "Snapshot volume 220B2-ss on secondary node 110B contains updates 220-a through 220-i and is a replica of snapshot volume 220A2-ss on primary node 110A." In order for the corresponding snapshot on the primary node and the secondary node to be synchronized, a replication relationship is established. "Establishing a replication relationship causes a change to data in the primary snapshot to be included in selected snapshot data copied to the corresponding snapshot on the secondary node." (Paragraph 0066.)

Colgrove is concerned with maintaining consistency between a snapshot on the primary node and the corresponding snapshot on the secondary node. As described in paragraph 0010, "The present invention ensures that a secondary snapshot volume containing a copy of the data used to restore the primary data store is available to be used to restore the copy of the data in the secondary data store." Colgrove does not describe selecting a snapshot of the primary volume to be restored nor does Colgrove describe loading the snapshot from the secondary volume to the primary volume as recited in claims 12 and 24 of the present application.

Because Colgrove does not disclose all of the elements of claims 12 and 24, the present invention is distinguishable over Colgrove. Based on the arguments presented above, withdrawal of the 35 U.S.C. §102(e) rejection of claims 12 and 24 is respectfully requested.

Claim Rejections - 35 USC §103(a)

Claims 3, 4, 15, and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Crockett in view of U.S. Patent No. 7,111,136 to Yamagami (hereinafter "Yamagami").

Claims 3, 4, 15, and 16 are dependent upon claims 1 and 13, respectively, which the Applicants believe are allowable over the primary reference (Crockett)

without the need for further discussion. Withdrawal of the 35 U.S.C. §103(a) rejection of claims 3, 4, 15, and 16 is respectfully requested.

Claims 5, 6, 17, and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Crockett in view of U.S. Patent No. 6,654,912 to Viswanathan et al. (hereinafter "Viswanathan").

Claims 5, 6, 17, and 18 are dependent upon claims 1 and 13, respectively, which the Applicants believe are allowable over the primary reference (Crockett) without the need for further discussion. Withdrawal of the 35 U.S.C. §103(a) rejection of claims 3, 4, 15, and 16 is respectfully requested.
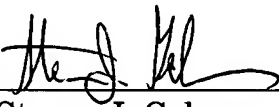
Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1-24, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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